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ABSTRACT

Staff Development for Pedagogues in Bilingual Math and Science provided two thematically-based workshops to 40 New York City science teachers who taught students of limited English proficiency (LEP) citywide. Workshops emphasized successful teaching strategies as well as psychological aspects involved in teaching LEP students. The project also provided research articles and monographs about the latest techniques in teaching science. Analysis of participants' responses to a questionnaire found that almost all respondents were highly satisfied with all aspects of the workshops: content, mode of preservation, and materials used. In addition, although the required data were unavailable, it appeared that the students of participating teachers performed as well as similar students citywide on the Regents Competency Tests (RCTs) in science. The project met its objectives for staff satisfaction with workshops and documentation of strategies learned. It was impossible to evaluate fully the objective for RCT in science passing rate, but the project came very close to meeting that part of the objective for which data were available. The conclusions, based on the findings of the evaluation, led to the recommendation that a compilation of the materials developed should be made available and distributed to other science teachers of LEP students. (Author/ND)

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OER Report

ED 384 573

Staff Development for Pedagogues in Bilingual Math and Science Programs 1993-94

FINAL EVALUATION REPORT

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Staff Development for Pedagogues
in Bilingual Math and Science Programs
1993-94

FINAL EVALUATION REPORT

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EXECUTIVE SUMMARY

Staff Development for Pedagogues in Bilingual Math and Science, funded with New York State categorical funds, provided two thematically-based workshops at Hunter College's Multifunctional Resource Center (MRC) to 40 science teachers who taught students of limited English proficiency (LEP) citywide. Workshops emphasized successful teaching strategies as well as psychological aspects involved in teaching LEP students. The project also provided research articles and monographs about the latest techniques in teaching science.

The Office of Educational Research (OER) analyzed participants' responses to a questionnaire and found that almost all respondents were highly satisfied with all aspects of the workshops: content, mode of presentation, and materials used. In addition, although the required data was unavailable, it appeared that the students of participating performed as well as similar students citywide on the Regents Competency Tests (R.C.T.s) in science.

The project met its objectives for staff satisfaction with workshops and documentation of strategies learned. OER was unable to fully evaluate the objective for R.C.T. in science passing rate, but the project came very close to meeting that part of the objective for which data was available.

The conclusions, based on the findings of this evaluation, lead to the following recommendation to the project:

- Make available a compilation of the materials developed and distribute them to other science teachers of LEP students.

ACKNOWLEDGMENTS

This report has been prepared by the Bilingual, Multicultural, and Early Childhood Education Evaluation Unit of the Office of Educational Research. Thanks are due to Mr. Elliott M. Roman for collecting the data and writing the report.

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I. INTRODUCTION

This report documents the Office of Educational Research's (OER's) evaluation of the Staff Development for Pedagogues in Bilingual Science Programs for 1993-94. The Office of High School Bilingual/English as a Second Language (E.S.L.) Programs of the Division of High School of the Board of Education of the City of New York operated the project which was funded by New York State bilingual categorical funds. The project provided science teachers and supervisory personnel with two thematically related workshops on science teaching strategies for students of limited English proficiency (LEP). The project also made available to participants a series of research articles and monographs.

The project director conducted a thorough needs assessment before the onset of the program. The major finding of the assessment were that (1) science materials for bilingual students were needed and (2) teachers required staff development in the latest teaching methodologies in science. The project, therefore, was designed to train professionals who taught science to LEP students. In addition, the project director met with assistant principals of science to discuss topics to be addressed in the workshops and to get input for the development of the project. After the themes were chosen, prominent individuals in the field of science were invited to conduct staff development sessions at the Multifunctional Resource Center (MRC) at Hunter College of the City University of New York (CUNY).

II. IMPLEMENTATION

PARTICIPANTS

Participation in the project was open to those who held high school science certification (bilingual or monolingual) and taught science to LEP students and to those supervisors responsible for implementing science programs that impacted on LEP students. Participation entailed attendance at two staff development sessions, sharing ideas, and volunteering to participate in collateral activities.

Targeted professionals received a memorandum explaining the program and describing the responsibilities of participants. As was the case in the previous year, responses outnumbered accommodations.

DELIVERY OF SERVICES

The project offered the staff development sessions in the fall and spring semesters of the 1993-94 academic year. The sessions were held on Saturdays at Hunter College to facilitate teachers' attendance. Dr. John Bruer, President of James S. McDonnell Foundation, spoke on "Recent Research Findings in Cognitive Psychology and Their Implications for the Effective Teaching of Mathematics and Science"; Dr. Jim Minstrell of Mercer Island High School, Seattle, spoke on "Effective Strategies in Teaching High School Science: From Novice to Expert"; Gilberto Cuevas of the University of Miami presented on "Mathematics Teacher as Researcher"; and Dr. John Penick, of the University of Iowa, spoke about "Successful Practices in Teaching Science to LEP Students." Each session included time for a group discussion after the presentation.

OER assisted the project director in developing a questionnaire on the certification and experience of participants. The results obtained from this questionnaire will be used in planning next year's staff development program.

FOCUS GROUP ACTIVITIES

A *Focus Group* activity was initiated in each of the six high school superintendencies. Each focus group consisted of a cadre of eight practitioners (including assistant principals and bilingual mathematics and science educators) who met biweekly over a four month period to discuss issues and concerns which impacted upon their ability to optimize mathematics and science instructional services for LEP students.

Some superintendencies implemented staff development sessions which were open to teachers at sites which required a more intense effort to improve student learning outcomes. Topics included cooperative groupings, the role of technology, wait time in questionning, and discourse in shaping a teaching/learning environment.

Some focus group members developed attitudinal inventories, other reviewed research articles; others undertook action research projects. At the last plenary presentation, each superintendency-based coordinator reported back to their colleagues as to the nature of their deliberations, their accomplishments, and the prospective challenges awaiting them. A meta-summary of the written reports of the focus groups from the six superintendencies was presented to the Executive Assistans for Instruction and disseminated systemwide.

III. OUTCOMES

STAFF DEVELOPMENT

- By the conclusion of the staff training period (September 1993-June 1994), 90 percent of the participating staff will demonstrate, as a result of participation in the science staff development workshops, a statistically significant level of satisfaction with the content, focus, mode of presentation, applicability, and relevance of materials and techniques explained and modeled.

OER developed a five-point Likert-type scale (with five being the most positive) to measure participants' satisfaction with workshops' content, focus, and mode of presentation. Participants could also rate the applicability and relevance of materials and techniques presented in the workshops. OER received 40 completed scales. (See Table 1.) Over 90 percent of respondents rated all areas but applicability of materials used highly; 87.5 percent gave that area high ratings.

The project met its staff development objective.

TABLE 1

Participants' Evaluation of Workshops

Satisfaction Areas	Mean Rating	S.D.	Percentage Reporting Highest Ratings
Content of workshops	4.7	0.72	92.5
Focus of workshops	4.65	0.74	92.5
Mode of presentation	4.57	0.86	90.0
Applicability of materials used	4.62	0.75	87.5
Relevancy of materials and techniques modeled	4.57	0.76	90.0

DOCUMENTING STRATEGIES LEARNED

- By the conclusion of the staff training period, each team of participants will have developed documentation (videotape, student/teacher materials, staff development plans) to indicate experimental efforts to implement the strategies advocated. Level of success will be the availability of such documentation for review and analysis, according to determined timelines.

In order to realize the effectiveness of the approaches learned in the workshops, all participating teachers kept diaries. They also formed into focus groups with district superintendents to offer ideas and discuss individual issues affecting their LEP students.

The project met its objective for documenting strategies learned.

SCIENCE REGENTS COMPETENCY TESTS

- By the conclusion of the staff development activity (June 30, 1994), a higher percentage of high school bilingual science students served by the project's participating teachers will have achieved criterion passing marks of 65 percent or higher on the Regents Competency Science Test as compared to a similar cohort of students receiving bilingual science instruction from project participants during preceding years.

OER compared the percentage of participating students who passed the Science R.C.T. with the percentage of students citywide who passed that exam. Fifty one percent of participating students passed the R.C.T. in science, compared to 58 percent of students citywide. While the passing rate for participants was not higher than the citywide rate, it should be noted that the two were very close and indicates a significant improvement since there is usually a 12 to 15 percent difference between the performance of LEP and English proficient students citywide. It was not possible to compare the performance of the current group of students to that of a

similar group from the previous year.

While OER was unable to evaluate the objective as stated and the project came close but failed to meet the part of the object for which there was data, it appeared that students served by the targeted teachers did improve their performance in science.

IV. CONCLUSIONS AND RECOMMENDATIONS

Staff Development for Pedagogues in Bilingual Math and Science Programs provided two thematically-based workshops for teachers of science in New York City whose work had a direct impact on LEP students. It also compiled and disseminated a series of research articles and monographs.

The project met its objectives for staff satisfaction with workshops and documentation of strategies learned. OER was unable to fully evaluate the objective for R.C.T. in science passing rate, but the project came very close to meeting that part of the objective for which data was available.

Although the project was unable to provide all the pertinent data for OER to

The conclusions, based on the findings of this evaluation, lead to the following recommendation to the project:

- Make available a compilation of the materials developed and distribute them to other science teachers of LEP students.